

PATENT SPECIFICATION

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729,492



Date of filing Complete Specification: Nov. 6, 1953.

Application Date: Nov. 8, 1952.

No. 28174/52.

(Patent of Addition to No. 718,720 dated Sept. 25, 1952).

Complete Specification Published: May 4, 1955.

Index at acceptance:—Class 103(5), B2(B6A: G).

COMPLETE SPECIFICATION

Improvements in Coupling Devices

We, NATIONAL RESEARCH DEVELOPMENT CORPORATION, a British Corporation established by Statute, of 1, Tilney Street, London, W.1, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

This invention relates to coupling devices and in particular to towing hooks for coupling a trailer vehicle to a tractor vehicle and is an improvement in or modification of the coupling devices according to prior application No. 22364/51 (Serial No. 718,720).

According to this invention one of the coupling members, which normally takes the load, is a rigid non-articulating element which includes a hook portion, on which element a moveable coupling member is pivotally mounted. The moveable coupling member may consist of an L-shaped member, the horizontal limb of which co-acts with the hook portion of the rigid element when the coupling device is in its operative position, and the vertical limb of the said L-shaped member is connected to the rigid member by a spring loaded toggle mechanism which restrains the L-shaped member in its operative position and in its releasing position.

The invention is illustrated, by way of example in the accompanying drawing in which Figure 1 is a side view of a coupling device in its operative position.

Figure 2 is a front view thereof.

Figure 3 is a longitudinal section of the coupling device in its operative position, and

Figure 4 is a longitudinal section of the coupling device in its inoperative or releasing position.

As shown in the drawing, a frame, adapted to be secured to a vehicle in any convenient manner, consists of a plate 1, brackets 2 extending therefrom, which brackets are spaced apart and disposed parallel to each other, and reinforcing webs 3 formed

integrally with the frame and, forming an extension of the brackets 2, is a downwardly directed hook member 4 which terminates in a hemispherical nose 5. Arranged between the brackets 2 and pivotally mounted upon a transverse pin 6 supported in bearings in the said brackets is a substantially L-shaped member 7, the normally horizontal limb of which engages or is close to the nose 5 of the hook 4 when the towing hook is in its operative position as shown in Figures 1 to 3. The L-shaped member 7 is held or locked in this position by a spring loaded toggle mechanism consisting of two parallel plates 8, shaped to fit snugly against the upper edges of the brackets 2 and disposed one on each side of the L-shaped member and pivotally connected to the upper end of said member by a pin 9; and a link 10 pivotally mounted at one end between the brackets 2 on a spindle 11 supported in the brackets 2 and pivotally connected at its other end to the plates 8 by a pin 12. This toggle mechanism is spring loaded by springs 13 which extend between the spindle 11 and studs 14 on the plates 8.

To enable the hook to be coupled to a link 15 or a drawbar, the plates 8 are moved clockwise about the pin 9 to the position shown in Figure 4. This causes the L-shaped member to be turned about the transverse pin 6 and to move away from the nose 5 of the hook 4, to the position shown in Figure 4 where it is retained by the springs 13 which, during the movement of the plates 8 and the L-shaped member 7, have been moved past the dead centre position of the plates 8 and the link 10. The link or draw bar can then be brought into engagement with the hook 4 and in so doing presses against a projecting part or nib 7a on the L-shaped member and turns the said L-shaped member clockwise against the action of the springs 13. This causes the plates 8 and the link 10 to be brought back into their operative positions shown in Figures 1 to 3. The L-shaped

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member is thus brought close to or in contact with the nose 5 of the hook 4 and prevents the disengagement of the hook and the ring or drawbar, whilst the springs 13, during the movement of the plates 8, link 10 and L-shaped member 7 to such operative positions, again pass the dead centre position of the plates 8 and the link 10 and serve to retain said plate 8 and the link 10 in their locking positions.

To disengage the link or draw bar from the hook 4, the toggle mechanism is again actuated to move the L-shaped member away from the nose 5 of the hook. Such movement of the toggle mechanism, for which a low ratio of release effort is required relative to the applied drag of the load, can be accomplished manually or in any other convenient manner. Thus a cartridge 16, adapted to be fired electrically, can be housed in a recess 17 in the underside of the link 10 and be connected to a suitable source of electrical energy by leads 18 which pass through a passage or slot 19 in the link 10. On firing the cartridge, the explosive reaction will lift the toggle mechanism over its dead centre position whereupon further movement of the toggle mechanism and the L-shaped coupling member is assisted by the springs 13. Any suitable mechanical or hydraulic means can, however, be provided to permit of remote actuation of the toggle mechanism. Upon such actuation the nib 7a on the L-shaped member 7 serves to disengage the link 15 or draw bar from the hook 4.

It is possible that in the space A, Figure 3, bounded by the brackets 2, the hook member 4, link 10 and the moveable coupling member 7 may become filled with mud which would normally prevent or considerably retard movement of the L-shaped member from its retaining position shown in Figure 2 to its releasing position shown in Figure 3. To avoid this an elongated slot 20 is provided in the vertical arm of the L-shaped member through which the mud can readily flow as the L-shaped member is moved about its pivot 6.

Although the moveable coupling member

is shown in the drawing as an L-shaped member, it can have any other suitable form. For example it may be an S-shaped member.

In the device according to the invention, the towing load is taken normally by the rigid non-articulating hook, instead of by a vertically swivelling hook, whilst by breaking the toggle mechanism the moveable coupling member, which is normally not subject to the towing load, is caused to release the link or draw bar.

What we claim is:—

1. A coupling device as claimed in Claim 1 of Application No. 22364/51 (Serial No. 718,720), wherein one of the coupling members, which normally takes the load, is a rigid non-articulating element which includes a hook portion, on which element a moveable coupling member is pivotally mounted.

2. A coupling member as claimed in Claim 1, wherein the moveable coupling member consists of an L-shaped member, the horizontal limb of which co-acts with the hook portion of the rigid element when the coupling device is in its operative position, and the vertical limb of the said L-shaped member is connected to the rigid member by a spring loaded toggle mechanism which restrains the L-shaped member in its operative position and in its releasing position.

3. A coupling member as claimed in Claim 1 or in Claim 2, wherein the moveable coupling member is provided with a projection or nib against which presses a draw-bar or the like when it is being moved into engagement with the hook portion of the rigid member, whereby the moveable coupling member is moved into its operative position and the toggle mechanism is moved into a position in which it restrains the moveable coupling member in its operative position.

4. A coupling member constructed, arranged and operating substantially as described with reference to the accompanying drawing.

R. G. CHANNEN,

Chartered Patent Agent,
Agent for Applicants.

PROVISIONAL SPECIFICATION

Improvements in Coupling Devices

We, NATIONAL RESEARCH DEVELOPMENT CORPORATION, a British Corporation established by Statute of 1, Tilney Street, London, W.1, do hereby declare this invention to be described in the following statement:—

This device consists of the type generally known as a Towing Hook mountable on a Tractor or the like, for towing a Trailer or another vehicle, and is such that the link or drawbar of the Trailer may be quickly attached to, and automatically locked to the said Hook and quickly released from same by distant manual means, by hydraulic means, or by an

electrically exploded cartridge in the device.

This device comprises a frame with means of attachment to any Tractor, the frame extending to and being integral with a robust inverted or down-wardly directed round pintle terminating in a hemispherical nose readily to engage a link or the eye of the drawbar of a Trailer in a space provided between the pintle and rest of the frame. The sides of the frame between the pintle and the attachment to the Tractor forms a box-like cavity in which a transverse pin is provided on which an L shaped lever may

- swivel. The lower or horizontal arm of this lever extends under the pintle to rise to, or fall away from the nose of the pintle, whilst the vertical arm emerges through and above the said cavity in the frame where it is connected to the top of the frame above the pintle by a spring loaded toggle. The toggle resting on the frame, forms a strut between the vertical arm of the L-shaped lever and the frame, the horizontal arm of the lever then being up against the nose of the pintle. This provides a locked support of the drawbar when engaged on the pintle. On elbowing or raising the knuckle of the Toggle by leverage therein provided, the Toggle is unstabilized as a strut and frees the L shaped lever from the pintle and jettisons the Trailer. The Toggle springs are so located that they retain the Toggle in the locked position as a strut and/or retain this mechanism in the fully open position. The closing action of the Toggle is combined with a projection on the L shaped lever, which projection protrudes into the space between the pintle and the frame so that the device may be closed and locked by inserting and lifting the drawbar eye onto the pintle.
- In this device the towing load is taken normally by the rigid non-articulating pintle, instead of by a vertically swivelling hook, whilst the release of the drawbar is effected by unstabilizing the Toggle to cause the L shaped lever to drop drawbar from the pintle. The L shaped lever is hollow in the cavity of the frame, to dislodge any adherence of mud inside the cavity.

Leamington Spa: Printed for Her Majesty's Stationery Office, by the Courier Press.—1955.
Published at The Patent Office, 25, Southampton Buildings, London, W.C.2, from which
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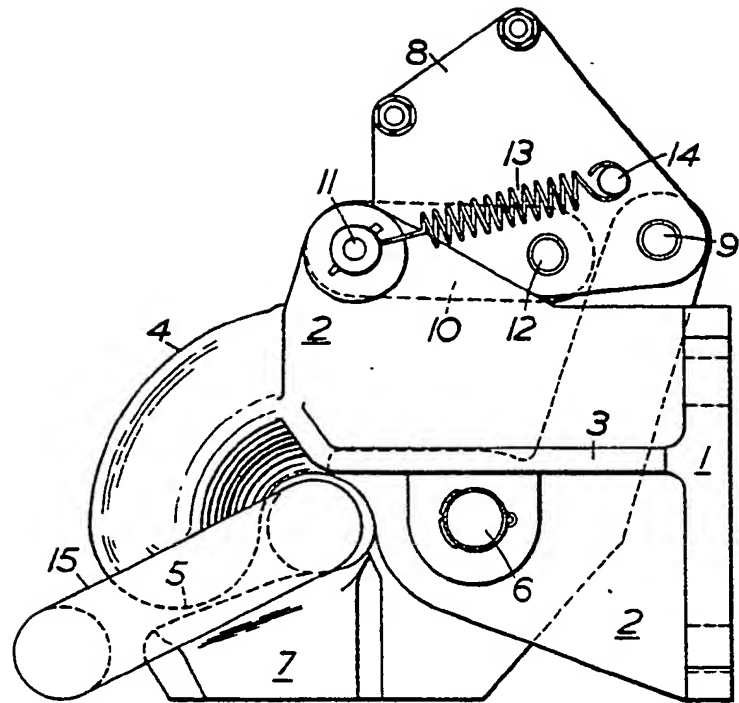


Fig. 1

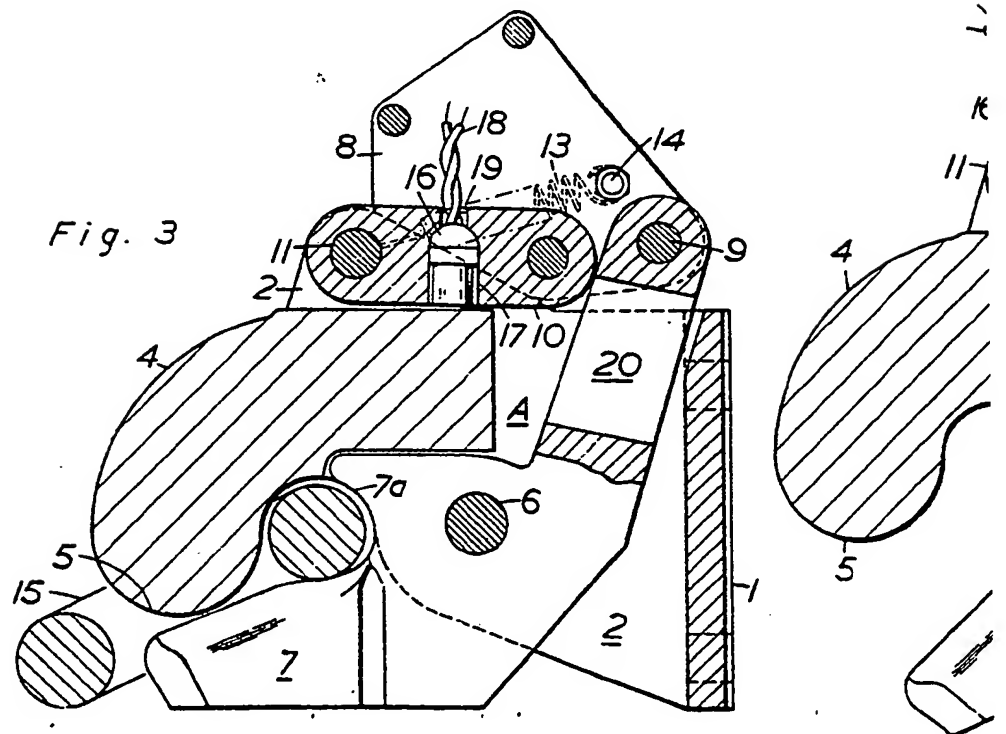


Fig. 3

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1 SHEET

This drawing is a reproduction of the Original on a reduced scale.

Fig. 1

Fig. 2

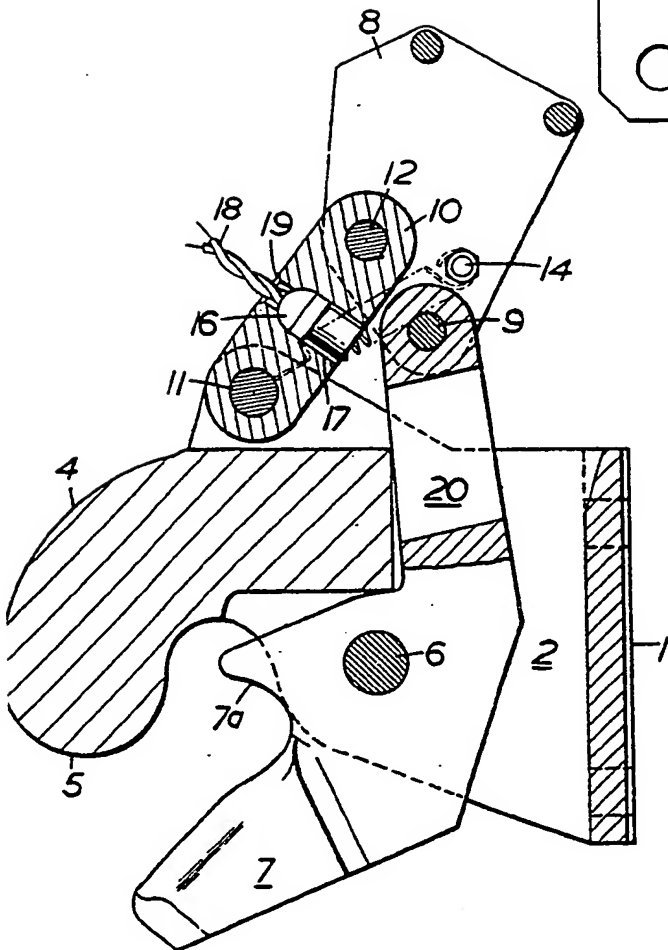
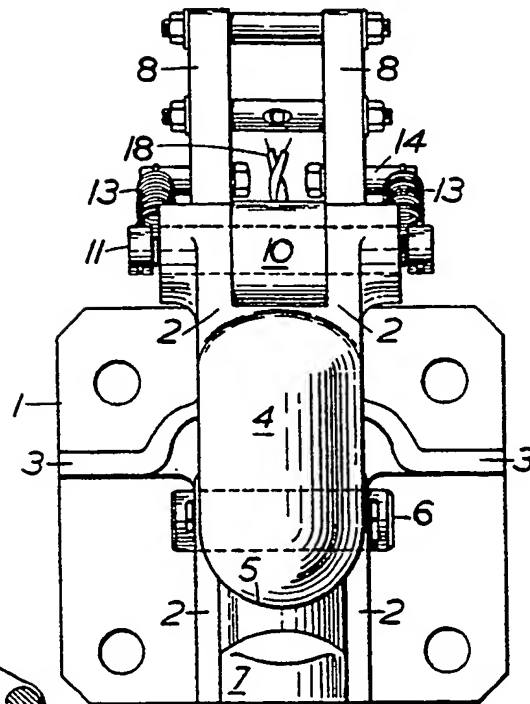


Fig. 4

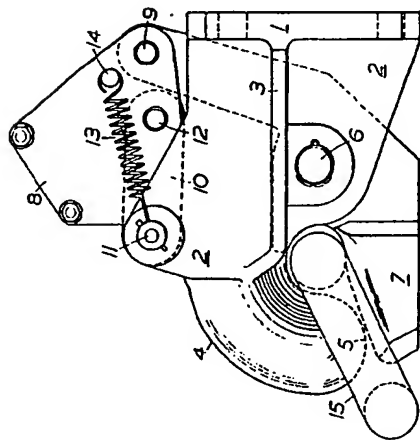


Fig. 1

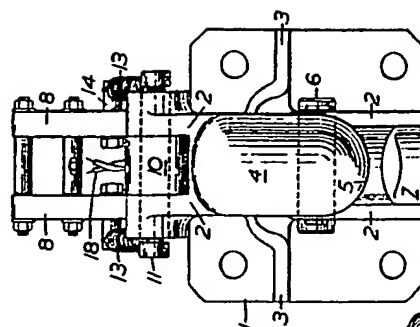


Fig. 2

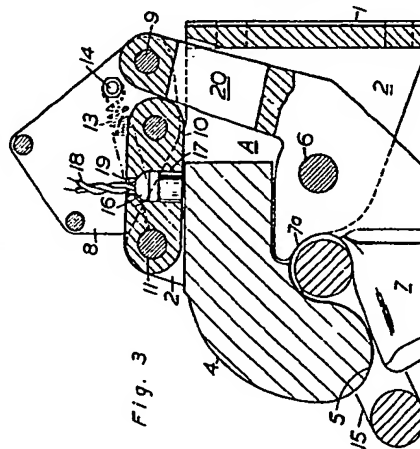


Fig. 3

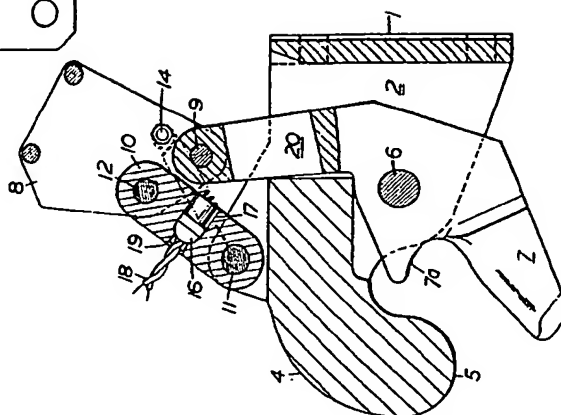


Fig. 4



INVESTOR IN PEOPLE

Application No: GB0329329.7

Examiner: Peter Macey

Claims searched: 1 - 10

Date of search: 27 May 2004

Patents Act 1977: Search Report under Section 17

Documents considered to be relevant:

Category	Relevant to claims	Identity of document and passage or figure of particular reference
A ✓	-	GB 2390588 A (BRADLEY DOUBLELOCK LIMITED)

Categories:

X	Document indicating lack of novelty or inventive step	A	Document indicating technological background and/or state of the art.
Y	Document indicating lack of inventive step if combined with one or more other documents of same category.	P	Document published on or after the declared priority date but before the filing date of this invention.
&	Member of the same patent family	E	Patent document published on or after, but with priority date earlier than, the filing date of this application.

Field of Search:

Search of GB, EP, WO & US patent documents classified in the following areas of the UKC^W :

B7T

Worldwide search of patent documents classified in the following areas of the IPC⁰⁷

B60D

The following online and other databases have been used in the preparation of this search report

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